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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,389	01/22/2002	Anton Sonntag	1748X/50832	6970

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EXAMINER	
YUAN, DAH WEI D	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 03/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/051,389	Applicant(s) SONNTAG ET AL.	
	Examiner Dah-Wei D. Yuan	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 December 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) *5-9* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 April 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

METHOD FOR CONTROLLING THE QUALITY OF THE COOLANT FOR FUEL CELL SYSTEMS

Examiner: Yuan S.N. 10/051,389 Art Unit: 1745 February 12, 2004

Detailed Action

1. The Applicant's amendment filed on December 10, 2003 was received. Claims 1,2 were amended. Claims 5-9 are withdrawn from consideration as indicated in the Office Action issued on September 11, 2003.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on September 11, 2003.

Claim Rejections - 35 USC § 102

3. Claims 1,4 are rejected under 35 U.S.C. 102(e) as being anticipated by Hortop (US 6,582,840 B2).

With respect to claim 1, Hortop teaches a method and apparatus for detecting leakage current in the coolant of a fuel cell stack. Leakage current flowing through the coolant can cause short circuiting, induce galvanic corrosion, electrolyze the coolant and reduce engine efficiency. Over time, the internal heat exchange faces of the bipolar plates begin to dissolve. The dissolution of small parts of material from the bipolar plates into the coolant, such as water, antifreeze, or mixtures thereof, can cause the coolant to become excessively conductive, resulting in excessive leakage current. Hortop further discloses the resistivity of the coolant is calculated (determined) by measuring the stack voltage from the positive terminal of the stack to

the negative terminal of the stack (a load circuit), calculating the resistance of the coolant, and using the resistance of the coolant and the physical parameters of the system to calculate the resistivity of the coolant from the resistance. Once the resistivity is calculated, the conductivity can also be calculated by taking the reciprocal of the resistivity. See Abstract, Column 2, Lines 7-19; Column 3, Lines 6-14.

With respect to claim 4, Hortop teaches the use of a controller or the implementation of a software in the main vehicle electronic control module to provide engine control diagnostic and maintenance operations. In one embodiment, if the coolant voltage (resistivity) read is less than or equal to a predetermined voltage level, the report could be a signal the controller can use to shut down the fuel cell operation. See Column 4, Line 58 to Column, Line 5; Column 6, Lines 3-11.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 2,3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hortop (US 6,582,840 B2) as applied to claims 1,4 above.

Hortop disclose a method for determining the quality of a fuel cell system as described above in Paragraph 3. Hortop further teaches the use of another predetermined voltage (resistivity) level to provide an alarm or other signal, prior to the coolant reaching an excessively conductive lever. The report could be an external alarm or some other diagnostic signal generated by the controller indicating a warning of the increase in conductivity. However, Hortop does not teach the controller to signal a need for replacement of coolant. It is well known in the art that replacement of the coolant in the cooling system is an effective way in restoring the integrity and function of the coolant. Therefore, it would have been obvious to one of ordinary skill in the art to deliver a coolant replacement signal in the fuel cell system when the resistivity of the coolant is below a predetermined level. See Column 6, Lines 29-54.

Response to Arguments

6. Applicant's arguments filed on December 10, 2003 have been fully considered but they are not persuasive.

Applicant's principle arguments are

(a) The instant specification discloses an insulation-monitoring device consisting of two stages: a first measuring-bridge balancing stage and a second measurement –signal processing buffer amplifier stage;

(b) Hortop does not disclose a method for determining coolant quality of a fuel cell system comprising determining the insulation resistance of a load circuit.

In response to Applicant's arguments, please consider the following comments.

(a) the claimed novelty is not stated in the independent claim;

(b) Hortop teaches a method of calculating (determining) the resistance of the coolant by measuring the stack voltage from the positive terminal of the stack to the negative terminal of the stack (a load circuit) in a fuel cell system. See Column 3, Lines 6-14.

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
February 12, 2004